126124-4

REMARKS

Claims 1-24 are pending in the present Application. Claims 1, 16 –19, and 24, have been amended, leaving Claims 1-24 for consideration upon entry of the present amendment. The Specification has been amended to reflect the amendments in the claims.

Support for amendment to Claims 1, 16-19, and 24, as well as to the Specification, Paragraphs [0004], [0005], [0017], [0029], [0020], and [0021], can at least be found in Claim 1 of the application as originally filed.

No new matter has been introduced by these amendments. Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Claim Objection

Claim 1 has been objected to because "[t]he nomenclature of the compounds does not differentiate substituents that are present in different aromatic rings." Applicants respectfully disagree. The nomenclature of the compounds is clear, definite, and supported by the specification. For example, Paragraph [0009] in conjunction with Formula I describe the compound, namely the 1-[4-(biphenyl-4-carbonyl)]phenylaminoanthraquinone, and provide the structure. Reconsideration and withdrawal of this objection are respectfully requested.

Claim Rejections Under 35 U.S.C. § 112, Second Paragraph

Claim 1 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, Claim 1 recites the limitation "said 1-[4-(4-phenylbenzoyl)]halobenzene". Appropriate corrections have been incorporated into Claims 1, 16-19, and 24. Additionally, the specification has been amended for clarity and consistency with the claims. Reconsideration and withdrawal of this rejection are respectfully requested.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1-24 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Hildreth et al. (US 3,507,606) in view of Rose (US 3,979,459) and further in view of Organic

126124-4

Chemistry (John McMurry, Second Ed., 1988, pages 751, 530-533; hereinafter "McMurry"). Applicants respectfully traverse this rejection.

> The Examiner states that:
>
> One skilled in the art would be motivated to combine the methods as disclosed in the individual references with an expectation of success based on the fact that the extended conjugation resulting from substituting a phenyl group with a biphenyl improves the dye characteristics. Thus it would have been obvious for one skilled in the art at the time the invention was made to combine the methods disclosed in the prior art references to obtain the method disclosed for the colorant composition in the instant invention.

It is admitted in the Office Action, however, that the prior art discloses the method based on a phenyl as opposed to a biphenyl substituent. It is also noted that Hildreth et al., are directed to the reaction between the 1-amino anthraquinone and, for example, bromobenzophenone. They fail to teach the steps of forming a 4-halobenzoyl halide composition and of forming a 1-[4-(biphenyl-4-carbonyl)]halobenzene composition from the 4-halobenzoyl halide composition as is taught and claimed in the present application.

To remedy the deficiencies of Hildreth et al., Rose is relied upon to "teach[] halogenated compounds and their preparation, such as the preparation of "4-phenyl benzophenones by way of Friedel Craft condensation reaction of the appropriate 4-halobenzoyl halide (with the halo group as fluoro, chloro or bromo)". (Office Action, page 3)

The present claims are directed to making a specific compound, namely 1-[4-(biphenyl-4-carbonyl)] phenylamino anthraquinone colorant composition. The application admits that anthraquinone derivatives have been widely used in various dye and pigment compositions and that numerous synthetic routes have been devised. (Paragraph [0002]) It also teaches the desirability to develop a convenient, scalable method for producing the 1-[4-(biphenyl-4-carbonyl)] phenylamino anthraquinone colorant composition. (Paragraph [0003]) In accordance with the need in the art, the present application claims methods for making the 1-[4-(biphenyl-4-carbonyl)] phenylamino anthraquinone colorant composition.

In one embodiment, the method comprises a process of reacting 4-halobenzoic acid and a halogenating agent to form a 4-halobenzoyl halide composition that is reacted with

biphenyl in the presence of a first catalyst composition to form a 1-[4-(biphenyl-4-carbonyl)]halobenzene composition. This 1-[4-(biphenyl-4-carbonyl)]halobenzene composition is then reacted, in the presence of a second catalyst composition and an acid scavenger, with a 1-aminoanthraquinone to form the 1-[4-(biphenyl-4-carbonyl)]phenylaminoanthraquinone colorant composition. (Claim 1) In another embodiment, the method comprises reacting 4-bromobenzoic acid with thionyl chloride to form a 4-bromobenzoyl chloride composition that is reacted with biphenyl to form a 1-[4-(biphenyl-4-carbonyl)]bromobenzene composition. The 1-[4-(biphenyl-4-carbonyl)]bromobenzene composition is reacted, in the presence of an acid scavenger comprising potassium carbonate and sodium acetate and a second catalyst composition comprising about 1 part of copper per part by weight of copper(I) iodide, with a 1-aminoanthraquinone in a solvent comprising N,N-dimethylformamide, to form the 1-[4-(biphenyl-4-carbonyl)] phenylamino anthraquinone colorant composition. (Claim 24)

The present application is to particular processes for making the 1-[4-(biphenyl-4-carbonyl)] phenylamino anthraquinone colorant composition. In order to attain applicants' claimed method with the combined teachings of Hildreth et al. and Rose, one must ignore the teaching of Hildreth et al. to combine the bromobenzophenone with the amino-anthraquinone and, in stead, chose from the phenyl benzophenones of Rose the 1-[4-(biphenyl-4-carbonyl)]halobenzene composition (no motivation or expectation of success to use a different compound, especially with the unpredictability of the chemical arts). Even with that choice, one must also determine a method to form the 4-halobenzoyl halide composition to be used in the formation of the 1-[4-(biphenyl-4-carbonyl)]halobenzene composition. The present claims are directed to a specific method. Hildreth et al. fail to teach each element of the present claims, and even in the step that Hildreth et al. allegedly "teach", they fail to teach the use of the claimed composition or the production of the claimed compound.

It is further noted that none of the references, alone or in combination, teach a method for producing a 1-[4-(biphenyl-4-carbonyl)]phenylaminoanthraquinone colorant composition comprising reacting a 4-bromobenzoic acid with thionyl chloride to form a 4-bromobenzoyl chloride composition. They also fail to teach reacting, in the presence of aluminum chloride,

the 4-bromobenzoyl chloride composition with biphenyl in a solvent comprising nitrobenzene, to form the 1-[4-(biphenyl-4-carbonyl)]bromobenzene composition. They finally fail to teach, reacting, in the presence of an acid scavenger comprising potassium carbonate and sodium acetate, and a second catalyst composition comprising about 1 part of copper per part by weight of copper(I) iodide, the 1-[4-(4-phenylbenzoyl)]bromobenzene composition with the 1-aminoanthraquinone in a solvent comprising N,N-dimethylformamide.

It is noted that the Office Action seems to insinuate that a process is not patentable unless the product is patentable. However, a novel, non-obvious process to produce a known product is patentable. Since there is no motivation or expectation of success to modify Hildreth et al., as suggested in the Office Action, the claimed process is non-obvious. Additionally, applicants contend that, if the 4-bromobenzophenone of Hildreth et al. is replaced with 1-[4-(biphenyl-4'-carbonyl)]bromobenzene, following the teachings of Hildreth et al., (e.g., Example 1), Hildreth et al. obtain different product than that obtained using the present invention. In other words, per Thin Layer Chromatography (TLC), the final product of Example 1 of Hildreth et al., while replacing the 4-bromobenzophenone of Hildreth et al. with 1-[4-(biphenyl-4'-carbonyl)]bromobenzene (as the Office Action appears to suggest), is not 1-[4-(biphenyl-4-carbonyl)]phenylaminoanthraquinone.

Consequently, for at least the reasons set forth above, Hildreth et al., in view of Rose and further in view of McMurry, does not motivate a person skilled in the art to modify Hildreth et al., with an expectation of success, to attain the present method. Hildreth et al., alone and in combination with Rose and McMurry, fail to render the present application obvious. Reconsideration and withdrawal of this rejection are respectfully requested.

126124-4

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and withdrawal of the rejections and objection, and allowance of the case are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 07-0862.

Respectfully submitted,

CANTOR COLBURN LLP

By _____
Pamela J. Curbelo
Registration No. 34,676

Date: October 7, 2004
CANTOR COLBURN LLP
55 Griffin Road South
Bloomfield, CT 06002
Telephone (860) 286-2929
Facsimile (860) 286-0115
Customer No.: 43248